CBC SEMINAR ANNOUNCEMENT

Professor Jin Dayong
University of Technology Sydney

Upconversion Super Dots for Super-Resolution Imaging and Single Molecule Tracking

Advances in super-resolution fluorescence imaging have enabled revolutionary new insight in the spatial and temporal behaviour of the cell. These developments have resulted in a need for the development of robust probes to facilitate long-term tracking of single molecules and real-time super-resolution imaging of sub-cellular structures.

In my lecture, I will first showcase several new nanotechnology approaches to super-resolution imaging by leveraging optical-switching properties of new classes of luminescent nanoparticles, unlocking new modes of super-resolution microscopy with much higher photon yields than are currently available.

I will then summarize our recent achievements by engineering time-resolved photonics devices and reagents to find cells earlier, quicker and with better resolution. These include the discovery of the Super Dots for single molecule detection and point-of-care diagnostics (Nature Nanotechnology 2013), demonstration of a time-domain multiplexing technology for high throughput biotechnology discoveries (Nature Photonics; Nature Communication 2014), creation of the large library of contrast agents for multi-functional bio-imaging and nanomedicine (Nature Communications 2016), invention of a low-power high contrast super resolution microscopy by achieving the highest optical resolution of 1/36 of the excitation wavelength (Nature 2017), the new discovery of thermal phonon enhanced upconversion Thermal Dots (Nature Photonics 2018), and our new development of a microscopy technique, aimed at improving the resolution and sensitivity of nanoscale imaging, leading to direct tracking of a single molecule inside a living cell by eye (Light: Science & Applications 2018).

Our Key Papers


Date: 25th April 2018 (Wednesday)
Time: 11:00am – 12:30pm
Venue: SPMS Research & Graduate Studies Office Conference Room
Host: Assoc Professor Zhao Yanli